

REMARKS

1. Status of the Application

Claims 1–11 were originally pending in the application. None of the claims have been canceled, and thus claims 1-11 remain at issue in the current application.

2. Rejection of the Claims in view of Kerr et al.

Claims 1-11 stand finally rejected under 35 U.S.C. §102(e) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over WO 98/28376 to Kerr et al. In order for a reference to act as a §102 bar to patentability, the reference must teach each and every element of the claimed invention. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983). Without the required teaching of “each and every element” as set forth in the claims, it is improper to maintain such rejections under §102(e). Kerr et al. do not teach each and every element of the claimed invention, and thus fails as an anticipatory reference. Similarly, Applicants’ invention is also not obvious in view of Kerr et al.

The present invention is directed to release liners. In the invention, a radiation curable silicone release agent is dispersed in an organic solvent and then applied onto the surface of a substrate. Dispersion of the silicone release agent in an organic solvent provides for smoother surfaces, better uniform coating and better adhesion of the release agent. The coated substrate is exposed to conditions sufficient to remove the solvent, e.g., heating optionally in the presence of high velocity air. The substrate is then exposed to radiation to cure the silicone release agent.

Applicants’ invention allows for the manufacture of a release liner having significantly reduced amounts of undesirable components, such as reduced total silicone extractables and/or volatile silicone compounds. Although not wishing to be bound by any explanation of the invention, it is currently believed that treating the coated substrate with heat and/or high velocity air not only drives off the solvent, but also provides molecular agitation of the compositions. As a result, volatile silicone compounds, which are present in such compositions, can be driven off as well, thereby reducing the amounts of such compounds in the cured product. Preferably, the release liners of the invention have no more than about 10 parts per million of such compound in the cured product. Low levels of volatiles results in a product useful in the electronics industry. Neither Kerr et al. nor Leir et al. teach or suggest this aspect of Applicants’ invention.

Kerr et al. is directed to solventless release compositions having a curable epoxyorganosiloxane, a cross-linkable silicone hydride resin having no epoxy functionality and a curing agent, the composition have “superior release properties.” (p. 1, lines 10-11). The composition can be coated onto a substrate and cured using actinic radiation to provide surface release properties. Kerr et al. do not use a solvent to disperse the composition. Kerr et al. UV cures the coated film at room temperature, and does not use the same high temperatures/high velocity air as Applicants.

Applicants’ composition includes a radiation curable silicone release coating in an organic solvent **absent** a crosslinkable silicone hydride resin. On the other hand, Kerr et al. specifically states “the inventors hypothesize that the combination of the epoxy function monomer with the hydride functional resin provides surprisingly unexpected synergies.” (p. 16, lines 25-27). Furthermore, Kerr et al. state “[i]t is theorized that the crosslinkable silicone hydride resin, upon coating and curing onto a surface of a substrate orients itself to the release surface . . . of the coating composition and sets.” (p. 16, lines 32-34 to p. 17, lines 1-2). The compositions are then able to provide the desired release values. (p. 17, lines 8-10). Thus, it is understood that the crosslinkable silicone hydride resin, absent in Applicants’ composition, is a necessary component of Kerr et al. to achieve the desired release values of Kerr et al.’s invention.

It is incorrect to state that Kerr et al. teach a “radiation cured silicone release coating in an organic solvent, absent a crosslinkable silicone hydride resin on the surface thereof.” (Office Action, p. 2). In fact, Kerr et al. specifically state that “[t]he second component of the novel composition of the present invention comprises a crosslinkable silicone hydride resin having no epoxy functionality.” (p. 8, lines 17-18). Furthermore, Kerr et al. is directed to a **solventless** composition. The only time a “solvent” is mentioned in the composition is as follows: “[i]n order to utilize crosslinkable silicone resins . . . it is often necessary that the resin be distributed in a solvent, such as xylene or toluene.” (p. 10, lines 16-18). However, Kerr et al. goes on to state “when making a solventless coating, the solvent [containing the crosslinkable silicone resins] is ultimately stripped from the final composition prior to coating and curing.” (p. 10, lines 19-20). This fact is demonstrated in the Examples of Kerr et al. (not the “Comparative Example” pointed to in the Office Action, which is not Kerr et al.’s invention), wherein the solvent is distilled off prior to mixing with the photoinitiator and prior to coating. Again, the goal of Kerr et al. is to provide a solventless system. Applicants, however, coat the substrate when their composition is in a solvent.

This difference in both the composition (Applicants use a radiation curable silicone release agent in an organic solvent and do not use a crosslinkable silicone hydride resin), and the difference in the process conditions (Kerr et al. UV cure at room temperature, while Applicants use forced air oven temperatures ranging from about 100°F to 325°F and then exposure to UV), results in a difference in the end products, specifically that Applicants' product contains an extremely low level of total extractables.

Application of the radiation curable silicone release materials in a solvent forms a release liner having significantly reduced amounts of total extractables and/or volatile organic compounds, while using lower coat weights as compared to solventless radiation cured systems (p. 3, lines 19-28). It is stated that "Kerr et al. disclose that the composition can be solvent free, which would appear to yield a volatile-free coating." (Office Action, p. 3). However, this is not a correct comparison of Kerr et al. and Applicants' composition. In fact, solvent-free silicones come with significant amounts of low molecular weight components from the polymerization reaction. Generally, this can be measured as 2 to 3% volatiles by standard tests. Volatiles of 2% would equate to 1,000 nanograms/ square centimeters. Comparison of Applicants' invention to that of a "conventional" release liner prepared without solvent and without a heating step are provided on page 21 of Applicants' specification, wherein "[s]amples of release liners of the invention and conventional UV cured silicone based release liners were analyzed for volatiles content by outgassing as described above." Kerr et al. is a "conventional UV cured silicone based release liner," "prepared without solvent and cured without a heating step" similar to Sample E of Applicants' invention. Therefore, it is correct to compare Applicants' invention, Samples C and D Sample E. From a simple comparison of the results, it is clear that Applicants' invention, Samples C and D, have a much lower level of siloxanes (57 nanograms/square centimeter and 32 nanograms/square centimeter, respectively), than the "conventional UV curable release liner prepared without solvent and cured without a heating step," Sample E (just as in Kerr et al.), and having a much higher siloxane reading of 474 nanograms/square centimeter.

Applicants respectfully submit that in view of the differences in compositions between its release liner and that of Kerr et al., the unique characteristics of Applicants' release liners, including its extremely low level of extractables, are not inherent in Kerr et al.

"To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by

probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

Applicants respectfully submit that the Examiner has misapplied the concept of “inherency” in view of the Kerr et al. reference. Further, “[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Int’f 1990). As discussed above, there are differences between the Applicants’ composition and that of Kerr et al., as well as process differences, which results in the coating comprising no more than about 1.5 micrograms per square centimeter total silicone extractables. The missing elements of extremely low levels of extractables is *not necessarily* present in Kerr et al. Therefore, the application of inherency is erroneous.

The Examiner alleges that because the same materials and process steps are used in Kerr et al. as in Applicants’ invention, the resulting products inherently have the same properties. However, Applicants have demonstrated that both its composition and process steps are different from that of Kerr et al. resulting in a product different from that of Kerr et al. Thus, it does not follow that the distinct differences in the two compositions would lead to a finding of inherency or obviousness between the release liners of Kerr et al. and Applicants. Applicants respectfully request that the rejection under §102(e) or alternatively, under 103(a) be withdrawn with respect to Claims 1-11.

3. Rejection of the Claims in view of Leir et al.

Claims 1-16 and 9-11 stand finally rejected under 35 U.S.C. §102(e) as being anticipated by, or in the alternative, under 35 U.S.C. 103 (a) as obvious over U.S. Patent No. 5,753,346 to Leir et al. In order for a reference to act as a §102 bar to patentability, the reference must teach each and every element of the claimed invention. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983). Without the required teaching of “each and every element” as set forth in the claims, it is improper to maintain such rejections under §102(e). Leir et al. do not teach each and every element of the claimed invention, and thus fails as an anticipatory reference. Similarly, Applicants’ invention is also not obvious in view of Leir et al.

Leir et al. describe a radiation cured silicone release coating from solutions of relatively low levels of a polyorganosiloxane substituted with small amounts of reactive functional groups

dissolved in a co-reactive monomer or mixture of monomers and containing a photoactive catalyst (col. 4, lines 21-28). Leir et al. state “a need exists for rapidly curing silicone coating which can be rapidly and completely **cured in air**” (emphasis added) (col. 4, lines 4-5). This statement is supported by the Examples of Leir et al., in which it is stated that “[t]he solvent was allowed to evaporate at room temperature . . .” (col. 12, lines 23-24). Statements are made in the Office Action that Leir et al. disclose the same silicone composition and curing temperature disclosed by Applicants are disclosed by Leir et al. in a working example (pages 17 and 18, Comparative Example 1). Office Action, p. 4. However, Applicants believe the reference is being made to Kerr et al., not Leir et al. Therefore, it is clear that Leir et al. does not teach or suggest the same composition or curing temperatures set forth in Applicants’ invention.

Furthermore, Leir et al. does not mention any measurement of extractables or volatiles in its disclosure, which is specifically claimed by Applicants. Again, in the Office Action the statement is made that “Leir et al. disclose that the solvent is evaporated from the coating, which would appear to yield a volatile-free coating.” Leir et al. actually states “[t]he solvent was allowed to evaporate at room temperature . . .” (col. 12, lines 23-24). There is no teaching in Leir et al. of the curing temperatures of 200°F to 250°F as taught by Applicants, which then results in a release liner having extremely low levels of silicone extractables.

Again, the Examiner must provide factual and technical grounds establishing that the inherent feature necessarily flows from the teachings in the prior art. Such a showing in relation to Leir et al. has not made, and the rejection of Claims 1-6 and 9-11 as being anticipated, or alternatively, obvious in view of Leir et al., fails.

Finally, Claims 7 and 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Leir et al. The rejected claims depend from independent claim 1 discussed above. Further, each of these dependent claims necessarily includes all of the limitations of the base independent claim from which it depends. If an independent claim is non-obvious under §103, then any claim depending therefrom is also non-obvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). As such, Applicants submit that the rejected claims are not obvious for the above reasons as well.

Conclusion

In view of the arguments presented above, Applicants respectfully submit that Claims 1-11 are now in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

Date: October 11, 2005

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